Remarks/Arguments

In response to the Rejection mailed January 12, 2005, Applicants have amended claim 16, and present the following remarks.

The amendment to claim 16 is made without prejudice to the refilling of the same claim in another patent application because applicants believe Borrelli et al is not prior art. Likewise for dependent claims based upon claim 16.

Claims 16, 18, 22-24 and 81 were rejected under 35 USC 102(e) as being anticipated by Borrelli et al. Claim 16 has been amended to recite that the agent of interest must be a protein that has not been denatured.

Borrelli et al use a number of harsh chemicals to immobilize their compounds and more harsh chemicals to harden the capillary contents. These chemicals denature and destructive to proteins. The main purpose of the arrays immobilizing proteins in the present invention is for the biological assays and the immunological assays. These require UNdenatured proteins. Borrelli et al cross links their compounds and uses other denaturing conditions such as the harsh chemical treatments and high temperatures taught with hydrocarbons (column 1, lines 1-13), epoxy polymerization (column 16, lines 50+), divinyl benzene linking (column 15, line 65 to column 16, line 45) and ethylene glycol, acrylamide polymerization (column 11 lines 27-52).

Furthermore, Borrelli et al heats their capillaries until they are plastic and stretches them to obtain the shape provided in Figs 6 and 7. The temperatures needed to melt glass or polymers denature or degrade proteins. Molten glass is clearly too hot and even the exemplified polymer (polypropylene) given in column 7 was heated to 150 degrees C, an obviously denaturing temperature to proteins (well above the boiling point of water).

While Borrelli et al may list a large number of different chemicals, including proteins, as usable, the conditions used indicate that any protein used would be denatured. Thus, immobilization of proteins without denaturing them is not taught. Such is claimed. The examiner has not shown that Borrelli et al is even enabled for immobilizing something other than nucleic acids. While denatured proteins have some purpose, for the present

invention, it is preferred and claimed that the proteins be immobilized and maintained without denaturing them. Accordingly, this feature is not taught by Borrelli et al and the rejection should be withdrawn.

The rejection also discusses claims 86 and 87 and therefore, it appears these claims may have been intended to be rejected also. The examiner contends that Borrelli et al may fill different channels with "a different mixture of a particular binding entity".

This still does not teach using different concentrations of the same agent of interest. These claims recite fibers with "***different concentrations of the same agent on different fibers***". As stated in Borrelli et al definitions "a particular binding entity" refers to a class of compounds, see column 11, lines 1-15. By contrast, the same agent of interest used in the claimed embodiment refers to the same molecule/cell/etc., which has at least two different concentrations in at least two fibers. The examiner has not shown where Borrelli et al teaches such a configuration.

It should also be noted that the purpose for having different concentrations in different fibers in the present invention is to make an easier quantitative determination. In Borrelli et al, they are concerned only with qualitative determination such as nucleic acid binding to determine the presence of a nucleic acid in a sample. The examiner has not shown where Borrelli et al measures amounts of the analyte a test sample. Therefore, there would be no reason to interpret Borrelli et al in a manner to suggest a quantitative determination or any reason at all to use different capillaries with differing concentrations of the same compound. Accordingly, the rejection should be withdrawn.

Claims 84 and 85 were rejected under 35 USC 103 as being unpatentable over Borrelli et al in view of Walt et al and further in view of Attridge et al. Borrelli et al is cited to show the basic design with Walt teaching an array of living cells and Attridge et al teaching immobilizing antibodies on a capillary wall. From this the examiner concludes it obvious to immobilize cells or microorganisms in the capillaries of Borrelli et al. This rejection is respectfully traversed.

Borrelli et al teach only molecules inside their capillaries. The substitution of a cell

or microorganism for a molecule in the Borrelli et al design would unlikely to be operable and therefore cannot be suggested. As stated in reply to the previous rejection above, the conditions used for generating the fiber bundle in Borrelli et al are too harsh for proteins. Cells and microorganisms require proteins for viability and metabolism and for a number of other reasons are even more sensitive to the harsh chemical and heat conditions than proteins. Furthermore, many of the chemicals used are toxic to living cells. Without maintaining the cells or microorganisms intact, one negates the reasons given in Walt et al for using cells in the first place, namely to maintain the cellular metabolism. Hence, for these reasons, the substitution of cells or microorganisms is even less suggested for the Borrelli et al technique.

Walt et al emphasizes maintaining viable cells in their array. Attridge et al emphasizes maintaining the immunological properties of their components. Borrelli et al is concerned with immobilized nucleic acids and uses conditions, which kills cells and denatures proteins (destroying their immunological binding properties). Thus, one would not find it obvious to use such cells or microorganisms in the Borrelli et al technique, as the examiner has not provided any reason to expect them to be operable.

The present invention was optimized with maintaining proteins in mind and thus in spite of some superficial similarities, the claimed invention is not taught by the combination of references cited above. The comments presented previously regarding Walt et al also apply for this rejection and provide an independent reason for patentability. Accordingly, the rejection should be withdrawn.

Claims 16-18, 81-82 and 84 were rejected under the doctrine of obviousness-type double patenting over claims 1-17 of U.S. Patent 6,713,309. Some of these claims were canceled. Applicants request this rejection bc delayed until the other claims have been indicated otherwise patentable. A terminal disclaimer may be filed at that time as needed depending on the claim language otherwise allowable.

In view of the amendments and comments above, the rejections other than obviousness-type double patenting have been overcome. Reconsideration, withdrawal of the

rejections and early indication of allowable claims are respectfully requested. If any issues remain, the examiner is encouraged to telephone the undersigned.

If needed, applicants petition for an extension of time under the provisions of 37 CFR 1.136(a) for sufficient time to accept this response. The commissioner hereby is authorized to charge payment of any fees under 37 CFR § 1.17, which may become due in connection with the instant application or credit any overpayment to Deposit Account No.500933.

Respectfully submitted,

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Attachment: Petition for a one-month extension of time.

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